

A SURVEY OF THE KNOWLEDGE, ATTITUDES, AND PRACTICES OF
PHYSICIANS RELATED TO BLOOD USE, TRANSFUSION, AND DONATION

Contract Number N01-HO-09007

FINAL METHODOLOGY REPORT

Deliverable "m"

Submitted to:

National Heart, Lung and Blood Institute
National Institutes of Health
9000 Rockville Pike
Building 31, Room 4A18
Bethesda, Maryland 20892

Submitted by:

The MayaTech Corporation
1300 Spring Street, Fifth Floor
Silver Spring, Maryland 20910-3618

March 31, 1994

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1.0 BACKGROUND

The **MayaTech** Corporation, under contract to the National Heart, Lung, and Blood Institute (NHLBI), conducted a stratified mail survey of physicians informally referred to as the Blood Resource Survey (BRS). This survey provides quantitative measures of the knowledge, attitudes, and practices related to autologous and homologous blood transfusion and donation of physicians in specialties that are heavy users of blood and blood products and of physicians in specialties involved in primary patient care. Specifically, the survey describes how numerous advances in the use of blood and blood components and alternatives to homologous blood transfusion have affected the medical community.

2.0 UNIVERSE AND SAMPLE

Doctors of Medicine (M.D.s) and Doctors of Osteopathy (D.O.s) who were practicing in the United States and who were 65 years old or younger comprised the universe for this survey. Two types of physicians were surveyed: heavy users of blood and blood products (anesthesiologists, cardiovascular surgeons, general surgeons, neonatologists, obstetricians and gynecologists, and orthopedic surgeons) and those who are involved in primary patient care and who are not heavy users of blood (family practitioners, general practitioners, and internists). Primary patient care physicians can order blood and blood products and perform some surgery; however, they are not surgical specialists. For this survey, these three specialties comprised one stratum.

2.1 The Sampling Frame

The sampling frame for the survey consisted of a list of all physicians within the selected specialties who were practicing in the United States during the survey period (in office and hospital-based practices) and who were 65 years of age or younger. The list included the physician's name, specialty, gender, year of birth, all available telephone numbers, and all available addresses.

Several organizations maintain comprehensive lists of physicians, such as the American Medical Association (AMA) and the American Osteopathic Association (AOA). The AMA and AOA have authorized a number of private companies to maintain a master file of physicians; **MayaTech** selected one of these companies, The Phoenix Marketing Group, to provide the sample according to the specifications given above. Procedures for selecting the sample are described in Section 2.4.

The AMA master file contains current and historical data on all physicians in the United States, including members and non-members of the association and graduates of foreign medical schools who are in the United States and meet education standards for primary recognition as physicians. For each physician, the file includes data on a large

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number of variables such as current address, type of practice (patient care, non-patient care), gender, specialties, type of employment (medical schools, hospitals, the Federal government), age of physician, practice characteristics, etc.

Every four years, the AMA sends questionnaires to all physicians residing in the United States, and to all U.S. physicians residing temporarily overseas, to update the data in the master file. Between questionnaires, a computerized weekly update system keeps the master file current. Each physician's record is updated as information becomes available to reflect changes in address, specialty, or professional activity. The AOA uses a similar procedure for maintaining its master file and keeps its master file current by conducting surveys of persons in the file every 18 months.

Prior to selecting the sample, Phoenix Marketing edited the database to purge inactive physicians, such as those known to be retired or deceased, from the file. MayaTech staff later applied a proprietary program to the physician database file to clean up the addresses (for example, expanding contractions such as RD to Rural Delivery or Road as appropriate) to assure minimal returns due to poorly keyed addresses and to improve the professional appearance of the mailings.

Physicians who indicated on completed or blank questionnaires that they were not currently practicing in the specialty indicated on the questionnaire and in the transmittal and endorsement letters, or who returned notes to that effect in lieu of questionnaires, were classified as ineligible and therefore out of scope. A small number of physicians returned completed questionnaires but did not mark the relevant specialty in response to the questionnaire item, "Please indicate your area(s) of specialty . . ." Some of these physicians might have formerly practiced in the specialty and might still have been board-certified to do so; some might only have marked **additional** specialties besides the primary specialty indicated on the questionnaire cover and transmittal letters; and some were probably misclassified in the AMA file.

2.2 Determination of Sample Sizes

A separate sample size was calculated for each specialty to permit separate estimates to be calculated with a tolerance of 5 percentage points at the 95 percent confidence level. Sample sizes were calculated using the following formula:

$$n_s = \frac{PQz^2}{(\epsilon)^2}$$

where

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P	=	proportion estimated
ε	=	maximum tolerance or error allowed
z	=	1.96, which corresponds to the 95% confidence interval under the normal curve
Q	=	1-P
n_s	=	sample size for stratum <i>s</i>

Table 1 presents sample size requirements, assuming error tolerances of 5 percent, confidence of 95 percent, and an estimated proportion of 0.50. Proportions of 0.50 require the largest sample sizes because other elements of the sample size equation are constant and PQ is maximized when P = 0.50 and, therefore, PQ = 0.25.

Table 1
Sample Size Requirements

Specialty	Total Physicians in Specialty (N _s) (1)	Sample Size (n _s)
Anesthesiologists	25,200	384
Cardiovascular Surgeons	2,384	331
Primary Care Physicians: Family Practitioners General Practitioners Internists Primary Care Total	47,516 25,265 75,709 148,490	384
General Surgeons	33,307	384
Neonatologists	1,515	306
Obstetricians & Gynecologists	30,177	384
Orthopedic Surgeons	18,779	384

(1) Estimated during the initial design of the study in 1989.

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The table indicates that a sample of 384 physicians was the largest **sample** size required to meet the confidence and tolerance specifications, assuming an estimate of 50 percent of the total population and ignoring the finite population correction (FPC) of $1 - (n/N)$ in the sampling variance formula. In strata with small numbers of physicians, **the** finite population factor was used, which resulted in slightly smaller sample sizes.

2.3 Sample Size Adjustment

The sample specifications required a sample size of slightly less than 400 physicians in each specialty (or specialty group, in the case of primary care physicians). Based on other physician surveys, we expected the non-response rate to be 30 percent and the out-of-scope rate to be 40 percent. As a result, the sample size was adjusted. First the requirement was rounded up to 400 for all specialties. Then an allowance was made for a 70 percent response rate by dividing the sample size by the response rate and an adjustment was made for a 40 percent out-of-scope rate by dividing by 1.0 minus the out-of-scope rate. The adjusted sample size calculation was therefore:

$$n^*_s = n_s / [(R)(1 - S)]$$

where

n^*_s = the adjusted sample size for specialty s

R = the expected response rate, .7

S = the expected out-of-scope rate, .4

n_s = 400

The calculation for all strata, therefore, was:

$$\begin{aligned} n^*_s &= 400 / [(.7)(1 - .4)] \\ &= 400 / [(.7)(.6)] \\ &= 400 / .42 \\ &= 952 \end{aligned}$$

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Given the worst-case estimates already made, we rounded this number down to 950 per specialty.

2.4 Selection of the Sample

A sample of 950 physicians was selected from each specialty by a simple random process without replacement, using an automated random number generator.

3.0 DATA COLLECTION PROCEDURES

The MayaTech Corporation, in consultation with NHLBI experts, designed seven variations of a questionnaire for each of the physician specialties surveyed to cover medical situations that are unique to each. The questionnaires were printed on a different color of paper for each specialty to ensure accuracy in the mailings. To obtain high response rates and to convince the sampled physicians that the expenditure of their time and effort was worthwhile, MayaTech took several measures, detailed below, to make participation as easy as possible. Table 2 summarizes the following characteristics of the BRS data collection activity:

- The mailing schedule actually followed (all dates in 1993);
- The endorsing organization, if any;
- The size of the sample;
- The response goal (number of responses needed within the specialty to achieve the survey's precision goal within the specialty);
- The number of complete responses (at least 50 percent of the questionnaire filled out) actually received;
- The number of responses as a percentage of the response goal; and
- The response rate.

3.1 Initial Mailing

MayaTech staff conducted the initial mailings in seven waves, by physician specialty, to assure efficiency and accuracy. We sent each physician in the sample an initial package which contained the following items:

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Table 2
Blood Resource Survey Summary

Event	Anesthe- siolo- gists	Cardio- vascular Surgeons	Primary Care Physicians	General Surgeons	Neo- natolo- gists	Obstetri- cians and Gynecolo- gists	Orthopedic Surgeons
Endorsement	ASA	ACC	None	ACS	AAP	ACOG	ACS
1st Package Mailed*	March 24	March 19	March 12	March 31	March 26	March 17	April 2
Postcard Mailed	March 31	March 26	March 19	April 7	April 2	March 24	April 9
2nd Package Mailed*	April 21	April 16	April 9	April 28	April 23	April 14	April 30
3rd Package Mailed*	May 19	May 14	May 7	May 26	May 21	May 12	May 28
4th Package Mailed*	June 16	June 11	June 4	June 23	June 18	June 9	June 25
Sample Size	949	950	950	950	950	950	950
Response Goal	384	331	384	384	306	384	384
Responses	593	594	434	509	666	523	523
% of Goal	154.4	179.5	113.0	132.6	217.6	136.2	136.2
Response Rate (%)**	68.2	67.3	50.1	57.6	75.9	57.9	58.9

All dates are in 1993.

***1st** Package included letter from director of NHLBI, endorsement letter (if available), and one copy of appropriate questionnaire; **2nd-4th** packages included letter from director of NHLBI and copy of appropriate questionnaire.

******Responses divided by initial sample less: known ineligible (deceased, not in clinical practice, etc.); undeliverable as addressed and no other address available; other final.

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- An introductory letter from Dr. Claude Lenfant, director of the National Heart, Lung, and Blood Institute, explaining the study and requesting that the physician participate (see Appendix A);
- An endorsement letter from the appropriate specialty organization, if an endorsement had been obtained (see Appendix A);
- A copy of the relevant specialty questionnaire; and
- A postage-paid return envelope addressed to NHLBI.

MayaTech staff personalized the introductory letter to each physician and digitized Dr. Lenfant's signature to convey to the recipient that he or she was one of only a small number of physicians from whom information was being sought and that their involvement in the study was critical to a successful outcome. Furthermore, MayaTech staff stamped each outgoing envelope with a "Personal" stamp in an attempt to bypass office staff who screen the mail to keep the survey out of the stream of business-related correspondence that might not reach the physician. A toll free telephone number was also provided to encourage physicians to call with any questions or concerns about the survey.

NHLBI obtained endorsement letters for six of the seven specialties (all but primary care physicians) from the following national professional organizations: the American Academy of Pediatrics (neonatologists), the American College of Cardiology (cardiovascular surgeons), the American College of Obstetricians and Gynecologists (obstetricians and gynecologists), the American College of Surgeons (general and orthopedic surgeons), and the American Society of Anesthesiologists (anesthesiologists). These letters reinforced NHLBI's request for participation by emphasizing to the physicians the importance of the study relative to their specialties.

MayaTech staff affixed identifying barcode labels to all questionnaires and return envelopes. The initial and follow up letters explained that these labels would be used only to identify physicians who had responded so that they would not receive follow-up mailings. Barcoding the mailings greatly accelerated the processing of incoming mail and preempted possible manual data entry mistakes.

The postage-paid return envelope included in every mailing (initial and follow up) facilitated physician participation, at no additional cost or effort to him or her, and made avoidance more difficult.

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3.2 Reminder Postcards

Postcards were mailed to the physicians one week after each initial mailing to remind them about the survey, thank those who had already replied, and urge those who had not, to respond promptly. These postcards indicated to the physicians NHLBI's commitment to gaining their professional opinions, encouraged their early response, and reduced the need for mailing follow-up packages (see Appendix A).

3.3 Follow-up Mailings

Follow-up packages were sent at intervals of 4, 8, and 12 weeks after the initial mailing only to physicians from whom no response had been received by the follow-up mailing date. Each of up to three follow-ups contained the same items as the initial package except for the endorsement letter, which was sent only once. A different letter, signed digitally by the NHLBI project officer, was used for each mailing and emphasized more strongly the urgency of responding to a study of such great social utility and importance to the physician's practice (see Appendix A). These mailings included copies of the questionnaires to preclude non-response due to loss or disposal of the copy sent in the initial mailing and additional pre-addressed, postage-paid envelopes to facilitate response.

3.4 Research Calls

MayaTech staff followed up on packages that were returned as undeliverable and unforwardable by telephone inquiries to state medical licensing boards and directory assistance in the original localities. When more current addresses were obtained the packages were remailed with the next wave of mailings.

4.0 TESTS OF DATA COLLECTION PROCEDURES

The MayaTech Corporation conducted a pretest primarily to test the content of the seven specialty questionnaires and to ensure an adequate response rate. Nine participants in each specialty were selected for the pretest.

Each questionnaire received a minimum of two rounds of pretesting. After the questionnaires were developed, members of the NHLBI working group tested them by administering them to one another. The second round involved pretesting the questionnaires with physicians who were recruited for participation through a number of methods. The target was to obtain nine physicians from each specialty of interest to this study. Project staff obtained names of physicians from the telephone yellow pages, others were provided

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by NHLBI consultants, and some were personal contacts of the project staff. Unlike the main survey, each physician was contacted by telephone prior to mailing the questionnaire. During this initial contact, the staff explained to the physician the purpose of the pretest, communicated the importance of the pretest to NHLBI, and impressed on the physician that his/her opinion was extremely valuable. Upon obtaining agreement to participate, project staff mailed an introductory letter on NHLBI letterhead, a questionnaire, and a postage-paid Federal Express envelope to the physician. Despite these efforts, a number of physicians did not respond and had to be followed up by telephone. The final response by specialty was as follows:

Anesthesiologists:	7
Cardiovascular Surgeons:	6
Primary Care Physicians:	6
General Surgeons:	6
Neonatologists:	4
Obstetricians and Gynecologists:	5
Orthopedic Surgeons:	4

The means by which physicians were recruited to participate in the pretest differed from the procedures planned for the national survey because the objectives of the pretest differed from those of the national survey. The pretest was designed to ensure that the instruments covered domains of importance to this survey; that the time involved in completing the questionnaire was not overburdening the physicians; and that the responses were received by MayaTech staff in the shortest time possible. The pretest simulated the national survey field conditions in that MayaTech targeted the same specialties and mailed the questionnaires to the physicians.

Project staff reviewed the completed pretest instruments for content and for physician comments; adjustments, such as deleting questions which were not crucial to the study and revising some response categories for others, were made accordingly. These changes resulted in shorter questionnaires--a suggestion made by the physicians.

5.0 QUALITY CONTROL

A data processing subcontractor for the project had had extensive experience converting written data to machine-readable format. Under the supervision of MayaTech staff, the subcontractor used the following quality control procedures:

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Manual editing. The completed questionnaires were manually edited to identify and resolve problems like illegibility, multiple responses, comments, and missing responses.

Key verification. All data were entered twice by different operators and the results were compared during the second entry session. The data entry staff resolved discrepancies through reference to the original document.

Machine editing and generation of error reports. All records were subjected to computerized evaluations of ranges and to cross-variable logic checks. Range checks were made during data entry. MayaTech staff provided the subcontractor with permissible formats and ranges for all variables, consulting NHLBI staff as necessary, and specified the limits of logical relationships between variables. The subcontractor generated error reports and returned them to The MayaTech Corporation with the questionnaires for further review and editing by project staff.

Data entry screens. All data were entered through monitor screens that replicated the respective questionnaire pages. This reduced the prospect that the operator would displace a series of variables by one or two positions as a result of a single entry error. The subcontractor incorporated range checks for most categorical variables and the data entry screens were programmed to prevent skip pattern violations and entry of multiple responses.

6.0 WEIGHTING OF RESPONSES

All data files submitted at the end of the project include weights to represent the different probabilities of selection for the various specialties. The weighting procedure takes into account the proportion of the sampling frame that is out of scope because of ineligibility. In the equations that follow,

N_s = Estimated number of physicians in specialty s

n'_s = The number of physicians originally sampled from specialty s

n''_s = The number of physicians originally sampled from specialty s found to be out of scope

We estimated the number of physicians in the population of specialty s to be in scope, N''_s , by multiplying the original estimate of the population by the proportion of the sample not found to be out of scope:

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$$N''_s = N_s [1 - (n''_s / n'_s)]$$

If n_s is the number of interviews completed, the weight, W_s , for each physician is the inverse of the selection probability from among the physician population in scope, or

$$W_s = 1/(n_s / N''_s) = N''_s / n_s$$

Table 3 contains the relevant data for calculation of specialty weights and shows the resulting weights as they were added to the response file. Estimates of the population of physicians in each specialty from which the sample was drawn were provided by the private vendor from which the sample was purchased. The vendor is licensed to maintain master lists of all physicians in the United States by the American Medical Association and the American Osteopathic Association and to retail information from these files for marketing and research. Note that although general practitioners, family practitioners, and internists together constituted a single specialty stratum for purposes of the Blood Resources Survey, separate weights were calculated for each. The original sample was drawn at the same rate from each of these three specialties but separate weights are required because of different response and ineligibility rates.

Table 3
Calculation of Weights

Specialty	N_s	n'_s	n''_s	N''_s	n_s	W_s
Anesthesiologists	21,386	949	79	19,606	593	33.062
Cardiovascular Surgeons	2,073	950	68	1,925	594	3.240
Primary Care Physicians						
Family Practitioners	37,920	323	25	34,985	158	221.424
General Practitioners	21,270	180	20	18,907	73	258.995
Internists	52,397	447	39	47,825	203	235.593
General Surgeons	19,432	950	66	18,082	509	35.525
Neonatologists	1,744	950	73	1,610	666	2.417
Obstetricians/Gynecologists	23,749	950	47	22,574	523	43.163
Orthopedic Surgeons	15,554	950	62	14,539	523	27.799

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7.0 RESPONSE RATES

Table 4 contains a summary of the final status of the samples. We used a computerized data base to record the status of all cases during the data collection period. "Out of scope" cases include four types of physicians:

- **Could not be found.** Letters to these physicians were returned as undeliverable. Presumably, some had retired from practice. We made tracing attempts within the city, county, and state of the address originally furnished, but could not trace physicians who had moved to other states. The sample included some military physicians who are often reassigned, sometimes to overseas posts.
- **Ineligible.** Some physicians indicated by notes or telephone calls that they were retired, not practicing medicine (for instance, full-time hospital administrators), or practicing in specialties other than those in which they had been sampled. These physicians were classified as "ineligible."
- **Other final.** This category included a few other physicians whose responses did not indicate ineligibility or refusal to participate, but who did not complete questionnaires; for instance, a physician was abroad and expected to return during the field period, but did not.

The number for refusals includes only physicians who explicitly refused. Usually, they used the postage-paid envelope to send a written refusal on an uncompleted questionnaire or on their own stationery. A few physicians used the toll-free telephone number to indicate that they would not participate and to ask that no further follow-up mailings be sent. The "refusal" category also includes physicians who sent in questionnaires but had marked responses on less than half the pages. "Passive" refusals--those who received one or more mailings but made a deliberate decision not to respond in any way--are not counted with explicit refusals because they are impossible to distinguish from a variety of other nonresponse situations, such as cases in which the physician never received any of our mailings but we never received any indication that the address was incorrect, cases in which the physician was dead or retired but we never received any indication of that, etc.

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Table 4
Response Status and Rates

Status	Anesthe- siolo- gists	Cardio- vascular Surgeons	Primary Care Physicians	General Surgeons	Neo- natolo- gists	Obstetri- cians and Gynecolo- gists	Orthopedic Surgeons	TOTAL
Total Sample	949	950	950	950	950	950	950	6,449
Out of Scope:								
Could Not Find	29	18	24	17	32	24	17	161
Ineligible	49	50	58	49	41	22	45	314
Other Final	1	0	2	0	0	1	0	4
Refusal--Number	13	18	35	25	2	24	41	158
Percent of Original Sample	1.4	1.9	3.7	2.6	0.2	2.5	4.3	2.4
No Response--Number	264	270	396	350	209	356	324	2,169
Percent of Original Sample	27.8	28.4	41.7	36.8	22.0	37.5	34.1	33.6
Completion--Number	593	594	434	509	666	523	523	3,842
Percent of Original Sample	62.5	62.5	45.7	53.6	70.1	55.1	55.1	59.6
Response Goal--Number	384	331	384	384	306	384	384	2,557
Completion--Percent of Goal	154.4	179.5	113.0	132.6	217.6	136.2	136.2	150.3
Response Rate--Percent (1)	68.2	67.3	50.1	57.6	75.9	57.9	58.9	64.4

(1) Response rate equal completions divided by the number in scope; number in scope equals original sample minus out number out of scope.

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A response rate of 60 percent can be considered to be relatively high for a mail survey without telephone follow-up among a busy and therefore resistant population to whom no incentives are being offered. Because the original sample size allowed for a higher proportion out of scope than actually developed, all completed samples were much larger than required for the precision goals of the study. Follow-up continued even after these minimum completion goals had been reached, to reduce non-response bias.

8.0 ANALYSIS OF RESPONSE AND NONRESPONSE

Comparison of respondents with nonrespondents and analysis of the response patterns among respondents suggests that estimates of knowledge, attitudes, and practices of all physicians in the seven specialties will not be biased by the fact that 50-75 percent of the eligible sample participated in the survey for each specialty.

8.1 Respondents vs. Nonrespondents

We had data available about both survey respondents and members of the sample who did not respond on four variables: age, gender, metropolitan/non-metropolitan location, and Census region (Northeast, Midwest, South, West). All four variables were provided for all sampled physicians by the mailing list vendor; the last two were derived from original ZIP codes and did not account for address changes discovered during the mailing process. All physicians with primary ZIP codes in metropolitan statistical areas were defined as "metropolitan;" all others were defined as "nonmetropolitan." We analyzed these four variables for six groups of physicians: physicians who responded promptly without any follow-up; those who responded only after the first follow-up letter; those who responded only after two follow-up letters; those who responded only after three follow-up letters; those who never responded; and those who provided responses indicating ineligibility because of retirement, practice in a different specialty, etc.

Examination of these variables revealed no systematic differences between respondents and non-respondents, and no systematic differences between early and late respondents that would suggest that physicians who never responded were different still. Chi-squares for cross-tabulations of the six response classes against the categories of gender, metropolitan/non-metropolitan location, and Census region were insignificant ($p > .10$) except for metro/non-metro among neonatologists ($p = .005$) and obstetricians/gynecologists ($p = .07$) and Census region among general surgeons ($p < .04$). Measures of strength of association (Cramér's V and λ) were less than .100 except for gender among obstetricians ($V = .200$) and metro/non-metro among neonatologists ($V = .132$). Therefore, there does not appear to have been any bias in the responses by gender, region, or metropolitan location. See Table 5.

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Table 5
Measures of Significance and Association,
Response Status vs. Demographic Variables

Measure	Anesthe- siologists	Cardio- vascular Surgeons	Primary Care Physicians	General Surgeons	Neonatology	Obstetricians/ Gynecolo- gists	Orthopedic Surgeons
AGE							
Significance of χ^2	.000	.000	.003	.009	.285	.252	.030
Cramér's V	.131	.265	.105	.100	.078	.079	.094
λ (a)	.018	.031	.000	.022	.000	.000	.039
λ (b)	.016	.047	.000	.000	.000	.000	.007
GENDER							
Significance of χ^2	.630	.736	.289	.261	.183	.200	.503
Cramér's V	.060	.054	.081	.083	.089	.200	.068
λ (a)	.000	.000	.000	.000	.000	.000	.000
λ (b)	.000	.005	.000	.000	.000	.000	.000
METROPOLITAN							
Significance of χ^2	.525	.600	.129	.347	.005	.070	.854
Cramér's V	.066	.062	.095	.077	.132	.104	.045
λ (a)	.000	.000	.000	.000	.000	.000	.000
λ (b)	.000	.000	.000	.000	.003	.000	.000
CENSUS REGION							
Significance of χ^2	.223	.839	.124	.037	.172	.347	.456
Cramér's V	.080	.060	.085	.093	.082	.076	.073
λ (a)	.005	.002	.018	.000	.003	.000	.017
λ (b)	.012	.012	.000	.000	.003	.000	.000

(a) Response status is independent variable

(b) Response status is dependent variable

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Five of the seven specialties did show statistically significant chi-squares for response status compared to age category: anesthesiologists ($p = .000$), cardiovascular surgeons ($p = .000$), general and family practitioners ($p = .003$), general surgeons ($p = .009$), and orthopedic surgeons ($p = .03$). However, the strength of association between response status and age was less than .200 for both V and λ except for cardiovascular surgeons ($V = .265$). Although the average early-responding cardiovascular surgeon was a year or two younger than the average cardiovascular surgeon who responded only after two or three follow-ups, there was a difference of only 1.1 years between the mean age of all respondents and the mean age of nonrespondents. The difference in mean age between respondents and non-respondents was less than a year for anesthesiologists, obstetricians/gynecologists, and orthopedic surgeons, and nonresponding primary care physicians and neonatologists had a lower mean age than respondents; only among general surgeons was the mean age of nonrespondents also more than a year greater than the mean age of respondents (respondents, 47.0; nonrespondents, 48.8; difference, 1.8 years). Therefore, older physicians had a slightly greater tendency than younger physicians not to respond, and the survey is slightly biased toward younger practitioners (except for the primary care stratum). However, 'the differences in the means are not statistically significant and there is no uniform tendency among respondents for younger physicians to reply after fewer follow-ups than older physicians required.

Ineligible physicians tended to be even older than nonrespondents. Presumably, this reflects the presence in that category of M.D.'s and D.O.'s who have retired, left the medical profession, or moved out of clinical practice to activities such as hospital administration.

8.2 Timing of Responses

Nearly half of the physicians who eventually responded did so promptly without any followup. However, not following up would have left us with a response rate of only about 30 per cent. Although the four variables for which we had data on all physicians do not show systematic differences between early and late responders, accepting only the early responses would have risked substantial bias in the other survey results. About a third of the eventual respondents replied after the first follow-up letter that included another copy of the questionnaire. (We had sent all sample physicians a reminder postcard shortly after the initial letter with questionnaire; it is not possible to tell from our data how many physicians responded before they received this postcard.) In most specialties, 10-15 percent of the responses were received after the second follow-up and about 10 percent after the third follow-up. Primary care physicians were particularly intractable, with only 35.8 percent of the responses arriving with no follow-up and nearly a-fifth (19.4 percent) not coming in until after three follow-ups; obstetricians and gynecologists had a similar response pattern. Table 6 and Exhibit 1 show these response pattern.

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Table 6
Response Patterns by Specialty

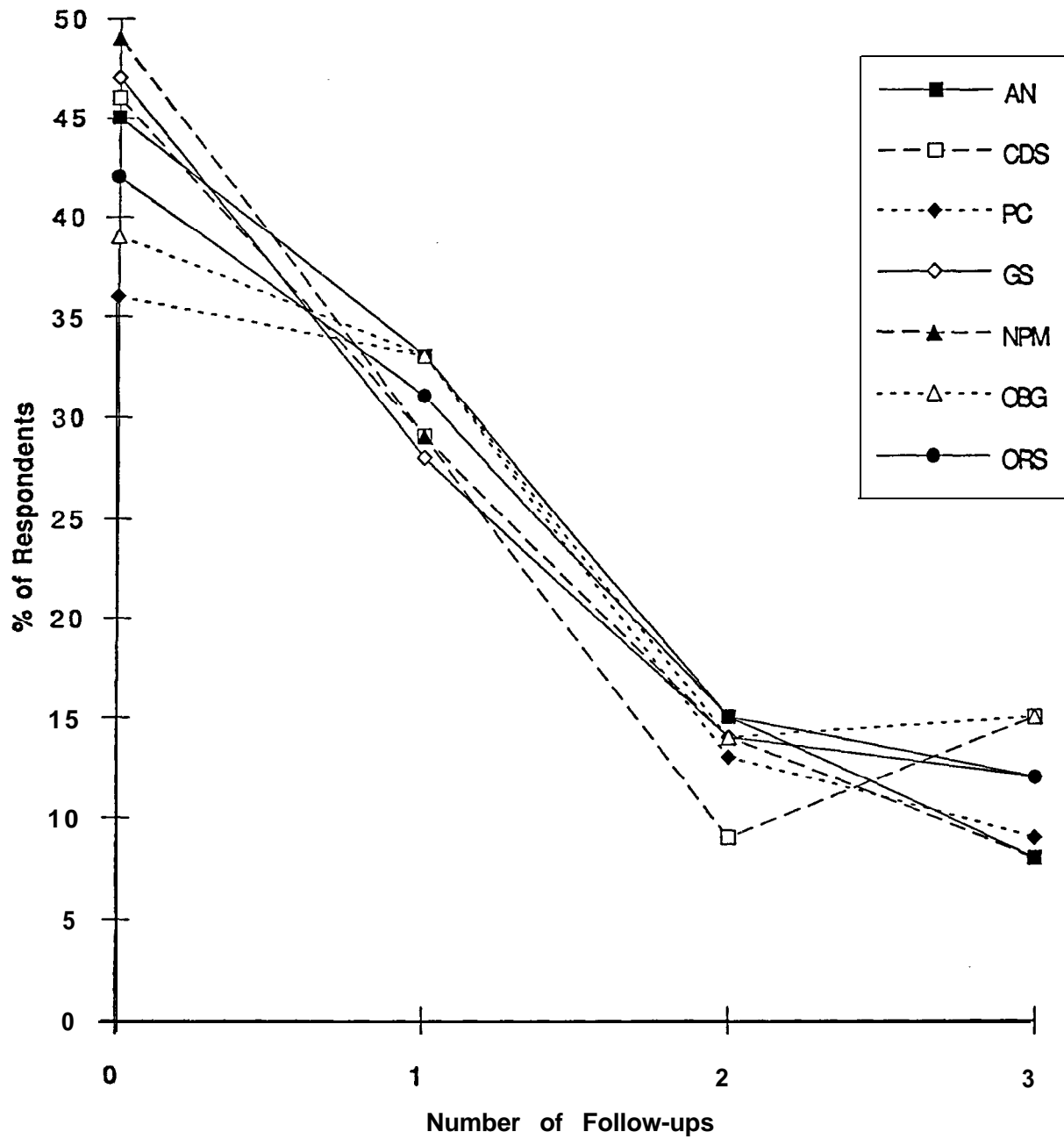
Specialty	% of Responses after Indicated Number of Follow-ups			
	None	1	2	3
Anesthesiologists	44.8	32.8	14.6	7.8
Cardiovascular Surgeons	46.1	29.4	9.3	15.2
Primary Care Physicians	35.8	32.3	12.5	19.4
General Surgeons	46.6	27.9	13.6	12.0
Neonatologists	48.5	29.4	14.2	8.0
Obstetricians/Gynecologists	38.8	32.7	13.8	14.7
Orthopedic Surgeons	42.4	30.9	14.6	12.1

8.3 Knowledge and Experience vs. Promptness of Response

Although we could compare respondents and nonrespondents only for the four variables included in the data we obtained from the mailing list vendor or could derive from those data, we could compare early and late respondents for any questionnaire items. Given the number of items in each questionnaire and the differences among questionnaires, a comprehensive analysis of early vs. late respondents was beyond the scope of the project; analysts are encouraged to perform their own analyses of early and late respondents for any variables in which they are interested. Substantial and consistent differences between early and late respondents would suggest, although not establish, that those who were even “later”-i.e., did not respond at all-might be different still, and that, therefore, the survey results might be biased. A consistent and substantial difference from early to late respondents would establish the direction of the bias but not its strength.

To test the hypothesis that there was no difference between the knowledge about blood transfusion practices between respondents and nonrespondents, and therefore no bias in the estimates of knowledge levels within the various specialties as a whole, we compared knowledge levels for early and late respondents for 12 items that appeared on all questionnaires. Table 7 lists the 12 items with their OMB item numbers for reference to the file documentation. Note that total practice hours and frequency of clinical encounters with transfusions are included in the “knowledge” items.

EXHIBIT 1
Respondents by Number of Follow-ups,
by Specialty



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Table 7
Items for Tests of Transfusion Knowledge

Item Number	Item
OMB05F	What is the total number of hours you typically spend per week in professional activities?--TOTAL
OMB07	In your current practice, how often do you encounter clinical situations requiring blood transfusions?
OMB30A	The nation's blood resources are in short supply--Strongly agree, somewhat agree, somewhat disagree, strongly disagree.
OMB30B	The nation's blood supply is safe--Strongly agree, somewhat agree, somewhat disagree, strongly disagree.
OMB38A	Most healthy adults can safely donate blood for themselves--Strongly agree, somewhat agree, somewhat disagree, strongly disagree, don't know.
OMB38D	Preoperative autologous blood donation is unnecessarily costly--Strongly agree, somewhat agree, somewhat disagree, strongly disagree, don't know.
OMB74A	Please indicate how useful these publications have been in your practice. Transfusion Alert: Use of Autologous Blood--Very useful, moderately useful, slightly useful, not useful, not familiar.
OMB74B	Please indicate how useful these publications have been in your practice. Indications for the Use of Red Blood Cells, Platelets, and Fresh Frozen Plasma --Very useful, moderately useful, slightly useful, not useful, not familiar.
OMB75A	... where 1 means "very confident" and 5 means "not confident," please rate your confidence in using the following blood components--Whole blood.
OMB75F	... where 1 means "very confident" and 5 means "not confident," please rate your confidence in using the following blood components--Cryoprecipitates.
OMB76B	... where 1 means "very knowledgeable" and 5 means "not knowledgeable," please rate your knowledge of the following topics--Transfusion-transmitted AIDS.
OMB76E	... where 1 means "very knowledgeable" and 5 means "not knowledgeable," please rate your knowledge of the following topics--Metabolic complications of massive transfusion.

There were few correlations between these items and the promptness or lateness of participation in the survey. Of the **84** combinations of questionnaire item and specialty, there was a statistically significant relationship between answers to a question and responsiveness for only 13, even using the relatively relaxed criterion of $p \leq .10$. These few associations were not consistent--sometimes the earlier respondents evinced more knowledge or experience with blood transfusions or publications, sometimes the later respondents thought they had more knowledge or experience. Therefore, comparison of responses to these 12 items to the amount of follow-up necessary to obtain a response suggests no

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systematic bias within the respondent population toward either less knowledge of **and** experience with transfusions or more knowledge and experience. In general, the **respondents** appear to be representative of the physician population in their knowledge of and experience with blood transfusions and guideline literature.

Table 8 contains the same measures of significance and association for these knowledge variables as Table 5 did for physician demographic characteristics.

Although there was a statistical relationship between total hours and responsiveness within two specialties, obstetricians/gynecologists and orthopedic surgeons, it was not consistent. While it might be expected that physicians working the longest hours would require the most follow-up to obtain responses, that was not true for either specialty. Part-time obstetricians/gynecologists (those reporting a total of 21-40 hours per week) had the largest proportion of late responses (three follow-ups); obstetricians/gynecologists reporting 41-60 hours per week had the smallest proportion of responses after three follow-ups. Orthopedic surgeons working 61-80 hours per week had the largest proportion of responses after three follow-ups in their specialty, but orthopedic surgeons working 41-60 hours per week had proportionately more responses before the first follow-up and a smaller proportion of responses after three follow-ups. It may be that the busy physicians sometimes had a large proportion of early responses because they either responded willingly upon receipt of the first mailing or were too busy ever to respond no matter how many mailings they received.

In two specialties, neonatologists and obstetricians/gynecologists, there was a tendency for the later respondents to report a lower frequency of clinical transfusion encounters. Among the obstetricians and gynecologists, the only difference was between those who responded without follow-up and those who only responded after at least one follow-up. Although physicians who rarely encounter transfusion situations might be inclined to dismiss a survey about them as **irrelevant** (or to consider themselves **irrelevant** to the survey) and to respond only after repeated appeals, this does not seem to have been the case except possibly for neonatologists; however, that specialty had by far the highest overall response rate.

Although the latest-responding general surgeons had a higher overall agreement with the proposition that the nation's blood supply is safe, there was no monotonic relationship between this opinion and responsiveness: general surgeons who participated before the first follow-up had the second highest overall agreement.

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Table 8
Measures of Significance and Association, Response Status vs.
Transfusion Knowledge and Experience Variables

Measure	Anesthe- siologists	Cardio- vascular Surgeons	Primary Care	General Surgeons	Neonatology gists	Obstetricians Gynecolo- gists	Orthopedic Surgeons
TOTAL HOURS/WEEK (OMB05F)							
Significance of χ^2	.604	.175	.763	.712	.724	.082	.005
Cramér's V	.087	.104	.082	.087	.077	.121	.138
λ (a)	.003	.009	.011	.004	.000	.016	.040
λ (b)	.000	.000	.000	.000	.008	.000	.005
TRANSFUSION FREQUENCY (OMBO7)							
Significance of χ^2	.489	.857	.193	.511	.010	.026	.294
Cramér's V	.081	.063	.111	.086	.109	.132	.094
λ (a)	.003	.006	.018	.004	.000	.009	.017
λ (b)	.028	.000	.000	.000	.089	.000	.031
BLOOD RESOURCES IN SHORT SUPPLY (OMB30A)							
Significance of χ^2	.709	.755	.837	.116	.942	.593	.511
Cramér's V	.073	.071	.089	.109	.065	.081	.105
λ (a)	.009	.000	.011	.004	.003	.000	.010
λ (b)	.004	.004	.005	.012	.000	.000	.000
AGREEMENT THAT BLOOD SUPPLY IS SAFE (OMB30B)							
Significance of χ^2	.879	.460	.990	.080	.850	.175	.505
Cramér's V	.083	.082	.058	.123	.062	.102	.096
λ (a)	.009	.000	.007	.007	.000	.000	.020
λ (b)	.000	.004	.005	.000	.000	.000	.000
HEALTHY ADULTS CAN AUTODONATE (OMB38A)							
Significance of χ^2	.062	.291	.346	.122	.669	.743	.875
Cramér's V	.107	.088	.112	.053	.070	.084	.066
λ (a)	.009	.003	.007	.004	.009	.022	.010
λ (b)	.000	.000	.018	.000	.000	.000	.000

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Measure	Anesthe- siologists	Cardio- vascular Surgeons	Primary Care	General Surgeons	Neonatology	Obstetricians Gynecolo- gists	Orthopedic Surgeons
AUTODONATION UNNECESSARILY COSTLY (OMB38D)							
Significance of χ^2	.506	.000	.126	.231	.636	.542	.546
Cramér's V	.099	.365	.126	.110	.080	.103	.094
λ (a)	.009	.009	.011	.004	.003	.003	.020
λ (b)	.003	.000	.003	.011	.004	.020	.000
TRANSFUSION ALERT USEFUL (OMB74A)							
Significance of χ^2	.311	.886	.276	.192	.832	.468	.571
Cramér's V	.098	.073	.116	.113	.081	.097	.093
λ (a)	.024	.012	.032	.000	.003	.006	.017
λ (b)	.000	.000	.011	.000	.000	.000	.000
INDICATIONS USEFUL (OMB74B)							
Significance of χ^2	.486	.354	.108	.053	.028	.626	.575
Cramér's V	.091	.096	.127	.137	.121	.099	.093
λ (a)	.009	.016	.025	.004	.015	.013	.003
λ (b)	.000	.000	.010	.000	.000	.000	.000
CONFIDENCE IN USE OF WHOLE BLOOD (OMB75A)							
Significance of χ^2	.820	.608	.635	.127	.050	.300	.927
Cramér's V	.094	.111	.110	.137	.117	.105	.093
λ (a)	.003	.022	.061	.015	.003	.016	.003
λ (b)	.006	.003	.036	.000	.005	.008	.018
CONFIDENCE IN USE OF CRYOPRECIPITATES (OMB75F)							
Significance of χ^2	.843	.694	.453	.078	.333	.342	.186
Cramér's V	.076	.092	.118	.133	.100	.112	.128
λ (a)	.003	.006	.014	.007	.000	.013	.007
λ (b)	.012	.003	.006	.013	.002	.000	.003

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Measure	Anesthe- siologists	Cardio- vascular Surgeons	Primary Care	General Surgeons	Neonatolo- gists	Obstetricians Gynecolo- gists	Orthopedic Surgeons
KNOWLEDGE OF TRANSFUSION-TRANSMITTED AIDS (OMB76B)							
Significance of χ^2	.538	.166	.025	.052	.728	.238	.687
Cramér's V	.098	.105	.140	.137	.077	.109	.089
λ (a)	.009	.006	.014	.022	.003	.016	.003
λ (b)	.000	.006	.004	.025	.006	.015	.009
KNOWLEDGE OF METABOLIC COMPLICATIONS OF MASSIVE TRANSFUSIONS (OMB76E)							
Significance of χ^2	.408	.912	.477	.266	.885	.062	.744
Cramér's V	.103	.071	.117	.108	.069	.134	.096
λ (a)	.015	.006	.011	.000	.006	.016	.003
λ (b)	.005	.003	.039	.037	.000	.023	.000

(a) Response status is independent variable

(b) Response status is dependent variable

Although there was a barely statistically significant ($p = .062$) relationship among anesthesiologists between responsiveness and agreement that most healthy adults can autodonate safely, there was no real pattern. Overall, 95.3 percent of anesthesiologists agreed strongly with the statement. The highest percentage not strongly agreeing (including blanks) was among anesthesiologists who responded after two follow-ups.

The strongest correlation between knowledge and responsiveness, in terms of both statistical significance and strength of relationship, occurred among cardiovascular surgeons in response to the statement that autologous blood donation is unnecessarily costly. The later they replied, the more agreement there was with the statement, suggesting that there might be even more agreement among those who did not reply at all. Also, the proportion of specialists who selected the "Don't know" response decreased with the number of follow-ups required to obtain a response. However, no other specialty displayed a similar statistically significant pattern.

We analyzed the evaluations of the usefulness of two of the blood donation guidelines listed in the questionnaires. The later they responded, the less familiar general surgeons were with "Indications for the Use of Red Blood Cells, Platelets, and Fresh Frozen Plasma," but the later neonatologists responded, the more familiar they were with the same

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publication. There was a slight tendency among general surgeons who were familiar with "Indications" to give it a higher rating the later they responded, but there was no such trend among neonatologists. Most members of both specialties did not rate the publication because they were not familiar with it: the "not familiar" proportion among general surgeons **rose from 67** percent among those who responded with no follow-up to **77** percent among those who responded only after three follow-ups; among neonatologists, the proportion expressing unfamiliarity fell from 75 percent to 60 percent as follow-ups increased. Overall, 72 percent of general surgeons and 69 percent of neonatologists professed insufficient familiarity with "Indications" to rate its usefulness.

In only one case did the two questions we evaluated about confidence in using various blood products produce a statistically significant result ($p = .05$). Among neonatologists, there was a slight tendency, but not a monotonic one, for the later respondents to feel more confident about using whole blood. However, there were basically two groups, a high group with an average rating of 4.00 consisting of those who responded after one and three follow-ups, and a low group with an average rating of 3.75 who responded after zero or two follow-ups. It is difficult to conclude from this pattern that the 25 percent of the sample who never responded at all would have been in the high-confidence group.

Evaluation of two of the self-rated knowledge questions produced only 3 statistically significant patterns (out of 14). Primary care physicians and general surgeons who responded later had less confidence in their knowledge of transfusion-transmitted AIDS than did those who responded earlier. Although there was a steady decline in the average rating within the primary care group (3.74, 3.59, 3.50, **3.43**), the principal difference among the general surgeons was between those who responded without follow-up and those who responded later (3.60, 3.38, 3.42, 3.32). The third statistically significant pattern, the rating by obstetricians and gynecologists about their knowledge of metabolic complications in blood transfusions, showed no overall trend except that the latest group thought themselves the most knowledgeable (average ratings of 2.51, 2.52, 2.52, 2.63).

Therefore, comparison of the survey participants' reports of their experience, knowledge, and confidence relating to blood transfusions does not support the hypothesis that nonrespondents were systematically different in these areas than respondents. Within the sampling errors inherent in a sample survey, the results of the Survey of the Knowledge, Attitudes, and Practices of Physicians Related to Blood Use, Transfusion, and Donation can be taken to be representative of the knowledge, attitudes, and practices of all practicing physicians in the United States in the seven specialties queried.

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9.0 ESTIMATES FOR THE SURVEYS

Two types of estimates can be calculated from the survey data: estimators of characteristics of the populations (medical specialties) from which the samples were drawn, and estimates of the sampling errors and confidence intervals associated with the population estimators.

9.1 Population Estimators

The estimator for the number of physicians in a specialty with characteristic X , such as a specific response to a categorical questionnaire item, is:

$$X'_s = \left(\frac{N_s}{n_s} \right) \left(\frac{n_s}{\dot{n}_s} \right) \sum_{i=1}^{\dot{n}_s} X_{si}$$

where: X_{si} = 1, if the i^{th} physician in specialty s is in the sample and has characteristic X

X_{si} = 0, otherwise

X'_s = estimated number of physicians with some characteristic, X , and specialty, s

N_s = number of physicians in stratum s in the universe

n_s = number of physicians in the sample in stratum s

\dot{n}_s = number of physicians in the sample in stratum s that are within scope of the survey and respond

\dot{n}_s = $n_s - n''_s$

The estimator across all specialties for characteristic X is:

$$X' = \sum_{s=1}^7 X'_s$$

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The estimator for a proportion in a specialty is:

$$P'_s = X'_s / N_s$$

If N_s is not an accurate count of physicians in the universe, a more accurate estimate of the proportion is $P' = X'_s / N'_s$, where N'_s is estimated the same way as the above estimator for X'_s , except that $X_{si} = 1$ for every sample physician in a specialty.

These estimators assume that a specialty is synonymous with a stratum, that is, all members of a specialty (anesthesiologists, for example) are listed in the stratum of anesthesiologists. The estimates by specialty will be biased to the extent that this assumption does not hold.

9.2 Computation of Sampling Errors and Confidence Intervals

Since the survey is based on a probability sample design, it is possible to draw inferences about the universe surveyed. This can be done through the use of confidence intervals placed about the estimates.

The confidence interval for a total may be written as:

$$X'_s \pm z\sigma_{x'_s}$$

and for a proportion as:

$$P'_s \pm z\sigma_{P'_s}$$

For 68 percent confidence, $z = 1$ and the probability is .68 that the true value being estimated lies within this interval. For 95 percent confidence, $z = 1.96$, and the probability is .95 that the true value being estimated lies within this interval.

The formulas for the standard errors are as follows:

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Standard error of a total

$$\sigma_{x'_s} = \sqrt{N_s^2 \left(1 - \frac{n_s}{N_s}\right) \sigma_{x_s}^2}$$

where $\sigma_{x_s}^2$ is the population variance for the X_i measure of specialty s , and a_s is the population standard deviation.

Standard error of a proportion

If the estimate for a proportion is:

$$P'_s = X'_s / N_s$$

where the universe total, N_s is known, the standard error of P' , is

$$\sigma_{P'_s} = \sqrt{\left(1 - \frac{n_s}{N_s}\right) \frac{1}{n_s} P'_s Q'_s}$$

If the estimate for a proportion is

$$P''_s = X'_s / N'_s$$

where N'_s is estimated from survey data, the standard error of P'' , is that of a ratio estimator,

$$\sigma_{P''_s} = \sqrt{\frac{1}{(N'_s)^2} [\sigma_{x'_s}^2 + (P''_s)^2 \sigma_{N'_s}^2 - 2P''_s \sigma_{x'_s N'_s}]}$$

where the last term of the equation is the covariance between X'_s and N'_s .

APPENDIX A

Initial Letter
Endorsement Letters
Reminder Postcard
Follow Up Letters



National Institutes of Health
National Heart, Lung, and
Blood Institute
Bethesda, Maryland 20892

April 2, 1993

Dr. [REDACTED]
[REDACTED]
[REDACTED]

Dear Dr. [REDACTED] :

The National Heart, Lung, and Blood Institute (NHLBI) is conducting a national study of physicians, to obtain information about their knowledge, attitudes, and practices with respect to the use of blood and blood products, blood donation and transfusion, and related patient education activities. The study will provide the Institute with data not available through any other source. The purpose of this study is to improve the educational **activities** and to evaluate the current programs and materials of NHLBI.

You have **been** selected to represent other physicians in your specialty. Your participation in this survey is important because the accuracy of the study depends on obtaining responses from everyone. The enclosed questionnaire will take about 20 minutes to complete. Please complete the questionnaire and return it in the self-addressed envelope. **MayaTech** is a health research firm in the Washington, **D.C.** area that is under contract to NHLBI to conduct this study.

Your participation in this study is voluntary. The information is being collected by The **MayaTech** Corporation under contract to the National Heart, Lung, and Blood Institute of the National Institutes of Health in compliance with the System of Records Notice **09-25-0156** under the Privacy Act. After the study is completed, any record that personally links you to a particular set of responses will be destroyed. The study data, which will not include any personal identifying information, will be stored at the National Heart, Lung, and Blood Institute. To avoid sending follow up questionnaires to physicians who have already participated in the study, barcode identifiers have **been** placed on each envelope and questionnaire. The study is authorized under Section 421 of the Public Health Service Act.

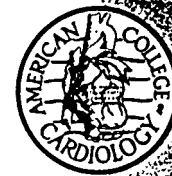
If you have any questions or **need** additional information, please contact the study's project officer, Ms. Clarice Brown, here at NHLBI, (301) **496-1051**, or the study's project director, Dr. Albert Parker, toll free at The **MayaTech** Corporation, (800) **475-1992**.

We greatly appreciate your cooperation in this effort.

Sincerely,

Claude **Lenfant**, MD.
Director

Initial Letter



American College of Cardiology

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800-253-4636

FAX (301) 897-9745

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DOUGLAS P. ZIPES, M.D.

Dear Colleague:

The National Heart, Lung, and Blood Institute (NHLBI) of the National Institutes of Health is conducting an important scientific study of physicians' knowledge, attitudes, and practices related to the use of blood and blood components. This is the first national survey of its kind and will provide valuable baseline data regarding transfusion practice.

As the President of the American College of Cardiology, I am asking that you please take the time from your busy schedule and participate in this very important study. Please complete the questionnaire and return it in the enclosed envelope.

Sincerely,

Adolph M. Hutter Jr.

Adolph M. Hutter, Jr., M.D., F.A.C.C.
President

Executive Vice President
F. LYNN MAY



American College of Surgeons

FOUNDED BY SURGEONS OF THE UNITED STATES AND CANADA, 1913

55 EAST ERIE STREET CHICAGO, ILLINOIS 60611 | 312 . 664-4050 FAX 312 . 440-7014

PAUL A. EBERT, M.D., F.A.C.S.
DIRECTOR

March, 1993

Dear Colleague:

The National Heart, Lung, and Blood Institute (NHLBI) of the National Institutes of Health is conducting an important scientific study of physicians' knowledge, attitudes, and practices related to the use of blood and blood components. This is the first national survey of its kind and will provide valuable baseline data regarding transfusion practice.

As the Director of the American College of Surgeons, I am asking that you please take the time from your busy schedule and participate in this very important study. Please complete the questionnaire and return it in the enclosed envelope.

Sincerely,

Paul A. Ebert, M.D., F.A.C.S.

PAE:cp

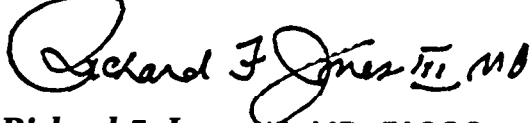
The
American
College of
Obstetricians and
Gynecologists

Dear **Colleague:**

The National **Heart, Lung, and Blood** Institute (NHLBI) of the National Institutes of Health is **conducting an important scientific study of physicians' knowledge, attitudes, and practices related to** the use of blood and blood components. This is the first national survey of its kind and will provide valuable baseline **data** regarding transfusion practice.

As the President of The American College of Obstetricians and Gynecologists, I am asking that you please take the time from your busy schedule and participate in this very important study. Please complete the questionnaire and return it in the enclosed envelope.

Sincerely,



Richard F. Jones, III, MD, FACOG
President

/s/

Enclosures

American
Academy of
Pediatrics



141 Northwest Point Blvd
PO Box 927
Elk Grove Village, IL 60009-0927
Phone 708/228-5005
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March, 1993

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Dear Colleague:

The National Heart, Lung, and Blood Institute (NHLBI) of the National Institutes of Health is conducting an important scientific study of physicians' knowledge, attitudes and practices related to the use of blood and blood components. This is the first national survey of its kind and will provide valuable baseline data regarding transfusion practice.

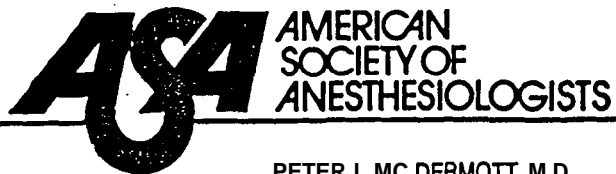
As the Executive Director of the American Academy of Pediatrics, I am asking that you please take the time from your busy schedule to participate in this very important study. Please complete the questionnaire and return it in the enclosed envelope.

Sincerely,

A handwritten signature in dark ink, appearing to read "James E. Strain".

James E. Strain, MD
Executive Director

ES:ms



PETER L MC DERMOTT, M.D.
President/1993
141 La Patera Drive
Camarillo, California 93010
(605) 482-3269
(606) 660-3269 (Cellular)

Dear Colleague:

The National Heart, Lung, and **Blood** Institute (**NHLBI**) of the National Institutes of Health is conducting an important scientific study of physicians' knowledge, attitudes, and practices **related** to the use of **blood** and **blood** components. This is the first **national** survey of its kind and **will** provide **valuable baseline** data regarding transfusion practice.

As the President of the American Society of Anesthesiologists, I am **asking** that you please take the time from your busy schedule and participate in this very important study. Please complete the questionnaire and return it in the enclosed envelope.

Sincerely,

A handwritten signature in black ink, appearing to read 'Peter L. McDermott, M.D.', with a stylized flourish at the end.

Peter L. McDermott, M.D.

Reminder Postcard

About a week ago, Dr. Claude **Lenfant** wrote to you requesting your participation in the National Heart, Lung, and Blood Institute's (**NHLBI**) national study of physicians and blood donation and transfusion. A questionnaire was enclosed with his letter.

If you have already completed and returned this questionnaire, thank you for your prompt response. **If** you have not received the questionnaire, please let us know so that we can **mail you** another copy. **If you have not completed and mailed the questionnaire, please do so as quickly as possible. If you** have any questions, you can contact me **toll free**, (800) **475-1992**. The **MayaTech** Corporation is under contract to NHLBI to conduct **the** study.

We are looking forward to your participation in this important study.

Albert C E. Parker, Ph.D.
Project Director
The **MayaTech** Corporation



National Institutes of Health
National Heart, Lung, and
Blood Institute
Bethesda, Maryland 20892

April 30, 1993

Dr. [REDACTED]
[REDACTED]
[REDACTED]

Dear Dr. [REDACTED] :

Several weeks ago, Dr. Claude Lenfant wrote to you about the national study of physicians' knowledge, attitudes, and practices related to the use of blood products, and patient education that NHLBI currently has under way. So far, however, The **MayaTech** Corporation, a health research company under contract to **NIH** to conduct the survey, has not received your completed questionnaire.

Because you are part of a scientific sample of practicing orthopedic surgeons, we need your voluntary participation to assure the validity of this study. We will not be able to determine the extent nor the areas to which we must target our educational efforts unless all practitioners are represented in this study. We have carefully limited the questions to those that will enable us to plan better programs for professional education and program evaluation.

In case you have not received the questionnaire, we have enclosed another copy. If you have already completed and returned this questionnaire, thank you for your prompt response. If you have not completed the questionnaire, please do so and return it as quickly as possible. To avoid sending follow up questionnaires to physicians who have already participated in the study, barcode identifiers have been **placed** on each envelope and questionnaire.

If you have any questions or need additional information, please call the study's project director, Dr. Albert Parker, toll free at The **MayaTech** Corporation, (800) 475-1992.

We are looking **forward** to your participation in this important study.

Sincerely,

Clarice D. Brown, M.S.
Project Officer

First Follow Up Letter



National Institutes of Health
National Heart, Lung, and
Blood Institute
Bethesda, Maryland 20892

May 28, 1993

Dr. [REDACTED]
[REDACTED]
[REDACTED]

Dear Dr. [REDACTED] :

Several weeks ago, I wrote to remind you that The **MayaTech** Corporation had not yet received your **completed** questionnaire for the study about physicians' knowledge, attitudes, and practices related to the use of blood products, and patient education that NHLBI currently has under way.

We understand that your patients make many demands on your time. However, because you are part of a scientific sample of practicing orthopedic surgeons, it is very important that you participate to assure the validity of this study. Unless all practitioners are properly represented, we will not be able to determine the extent nor the areas to which we must target our educational efforts. We have carefully limited the questions to those that will enable us to plan better programs for professional education and program **evaluation**.

In case you have not received the questionnaire, we have **enclosed** another copy. If you have already completed and returned this questionnaire, thank you for your prompt response. If you have not completed the questionnaire, please take some time to complete it and return it as soon as possible. To avoid sending follow up questionnaires to physicians who have **already** participated in the study, barcode identifiers have been placed on each envelope and questionnaire.

If you have any questions or need additional information, **please call** the study's project director, Dr. Albert Parker, of The **MayaTech** Corporation, toll free (800) **475-1992**.

We are looking forward to your participation in this important study.

Sincerely,

Clarice D. Brown, M.S.
Project Officer

Second Follow Up Letter



National Institutes of Health
National Heart, Lung, and
Blood Institute
Bethesda, Maryland 20892

June 25, 1993

Dr. [REDACTED]
[REDACTED]
[REDACTED]

Dear Dr. [REDACTED] :

Several weeks ago, I wrote you a second letter informing you that The **MayaTech** Corporation still had not received your completed questionnaire for the study about physicians' knowledge, attitudes, and **practices** related to the use of blood products and patient education that NHLBI currently has under way.

Because you are part of a scientific sample of practicing orthopedic surgeons, the validity of this study depends completely upon your voluntary participation. Unless all practitioners are represented in this study, we will not be able to determine the extent nor the **areas** to which we must target our educational **efforts**. We have carefully limited the questions to those that will enable us to plan better programs for **professional** education and program evaluation.

Because **we** are nearing the end of our study period and full participation by everyone in our sample is so important, we have enclosed another questionnaire. If you have already returned this **questionnaire**, thank you for your response. If you have not completed the questionnaire, we most urgently ask you to do so and return it as soon as possible. To avoid sending follow up questionnaires to physicians who have **already** Participated in the study, barcode identifiers have been placed on each envelope and **questionnaire**.

If **you have** any questions or need additional information, please call the **study's** project director, Dr. Albert Parker, toll free at The **MayaTech** Corporation, (800) 475-1992.

We are looking forward to your participation in this important study.

Sincerely,

Clarice D. Brown, M.S.
Project Officer

Third Follow Up Letter